

International IOR Rectifier

PD-2.255 rev. A 12/97

163CMQ... SERIES

SCHOTTKY RECTIFIER

160 Amp

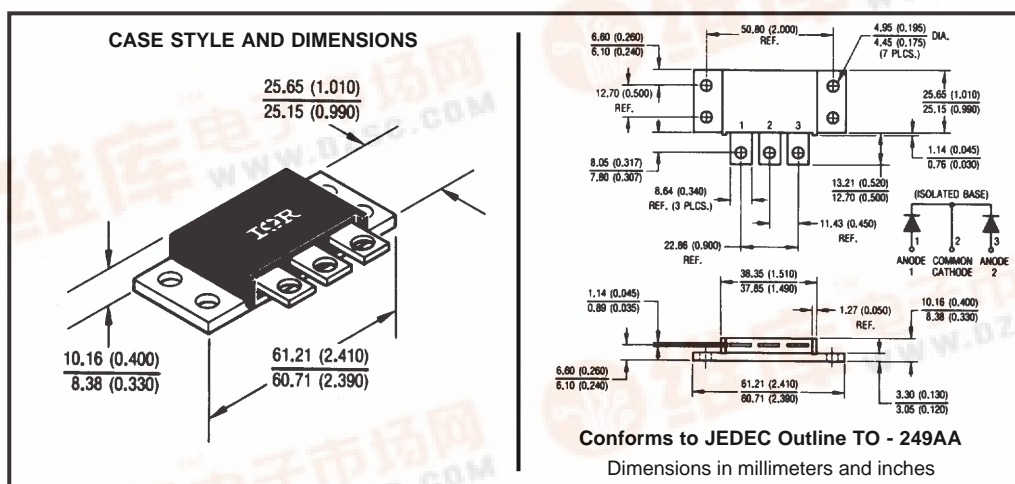
Major Ratings and Characteristics

Characteristics	163CMQ...	Units
$I_{F(AV)}$ Rectangular waveform	160	A
V_{RRM} range	80 to 100	V
I_{FSM} @ $t_p = 5 \mu s$ sine	9000	A
V_F @ 80 Apk, $T_J = 125^\circ C$ (per leg)	0.80	V
T_J range	-55 to 175	$^\circ C$

Description/Features

The 163CMQ isolated center tap Schottky rectifier module series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to $175^\circ C$ junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- $175^\circ C$ T_J operation
- Isolated heatsink
- Center tap module
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Low profile, high current package



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Voltage Ratings

Part number	163CMQ080	163CMQ100
V_R Max. DC Reverse Voltage (V)	80	100
V_{RWM} Max. Working Peak Reverse Voltage (V)		

Absolute Maximum Ratings

Parameters	163CMQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	160	A	50% duty cycle @ $T_C = 87^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	9000	A	Following any rated load condition and with rated V_{RWM} applied
	800		
E_{AS} Non-Repetitive Avalanche Energy (Per Leg)	15	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 1$ Amps, $L = 30$ mH
I_{AR} Repetitive Avalanche Current (Per Leg)	1	A	Current decaying linearly to zero in 1 μsec Frequency limited by T_J max. $V_A = 1.5 \times V_R$ typical

Electrical Specifications

Parameters	163CMQ	Units	Conditions
V_{FM} Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.98	V	@ 80A
	1.17	V	@ 160A
	0.80	V	@ 80A
	0.96	V	@ 160A
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	1.5	mA	$T_J = 25^\circ\text{C}$
	20	mA	$T_J = 125^\circ\text{C}$
C_T Max. Junction Capacitance (Per Leg)	1400	pF	$V_R = 5V_{DC}$, (test signal range 100Khz to 1Mhz) 25°C
L_S Typical Series Inductance (Per Leg)	8.0	nH	Measured from terminal hole to terminal hole
dv/dt Max. Voltage Rate of Change (Rated V_R)	10,000	V/ μs	

(1) Pulse Width < 300 μs , Duty Cycle <2%

Thermal-Mechanical Specifications

Parameters	163CMQ	Units	Conditions
T_J Max. Junction Temperature Range	-55 to 175	$^\circ\text{C}$	
T_{stg} Max. Storage Temperature Range	-55 to 175	$^\circ\text{C}$	
R_{thJC} Max. Thermal Resistance Junction to Case (Per Leg)	1.0	$^\circ\text{C}/\text{W}$	DC operation * See Fig. 4
R_{thJC} Max. Thermal Resistance Junction to Case (Per Package)	0.50	$^\circ\text{C}/\text{W}$	DC operation
R_{thCS} Typical Thermal Resistance, Case to Heatsink	0.10	$^\circ\text{C}/\text{W}$	Mounting surface, smooth and greased
wt Approximate Weight	58 (2.0)	g (oz.)	
T Mounting Torque	Min. 40 (35)	Kg-cm (lbf-in)	
	Max. 58 (50)		
Case Style	TO-249AA	JEDEC	

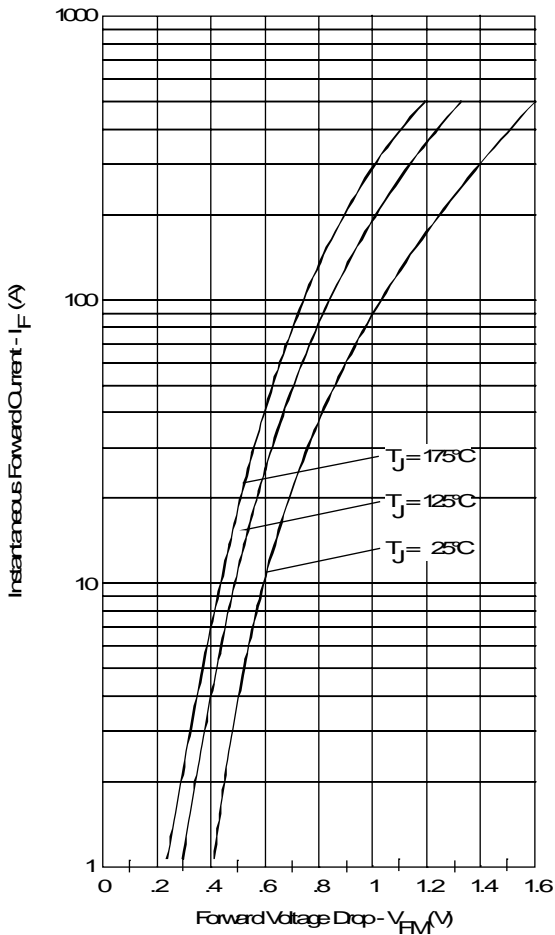


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

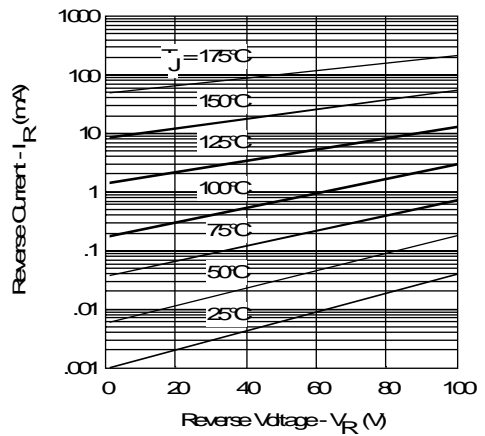


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

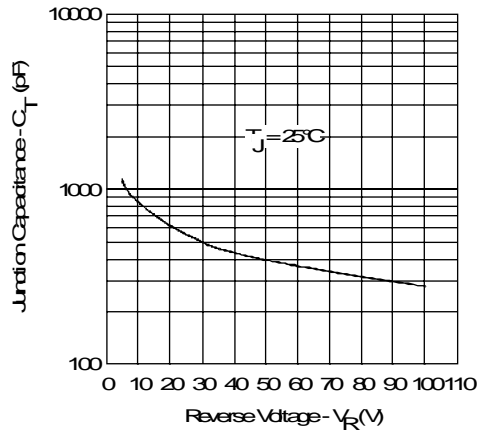


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

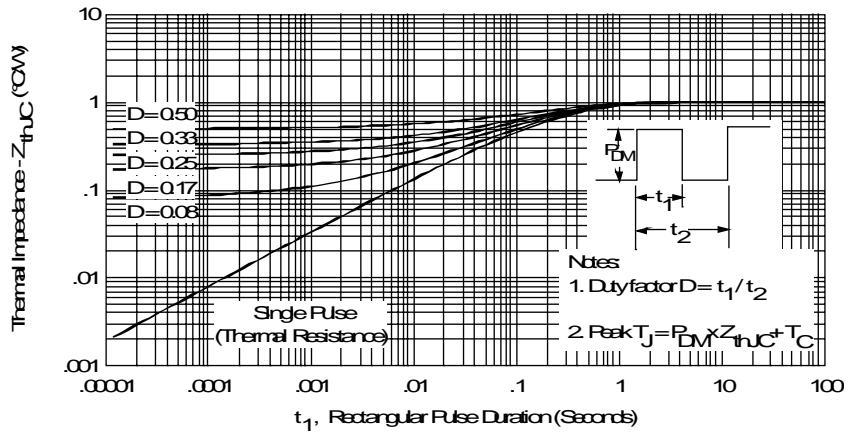


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

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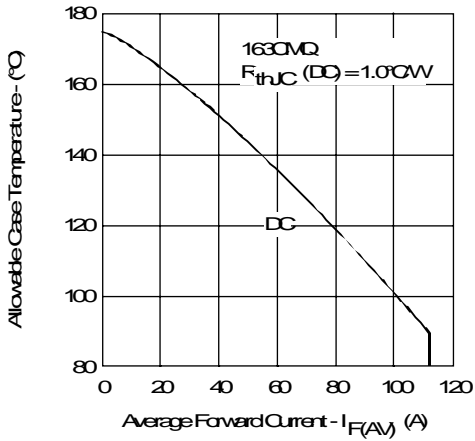


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

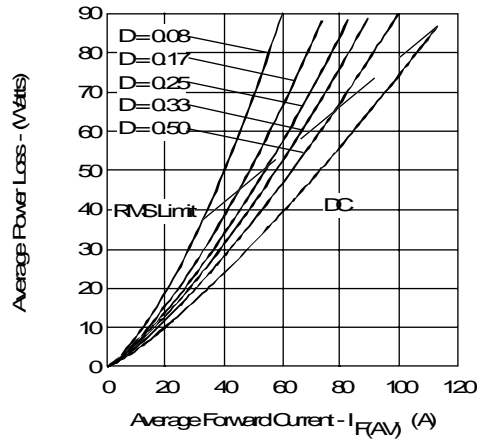


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

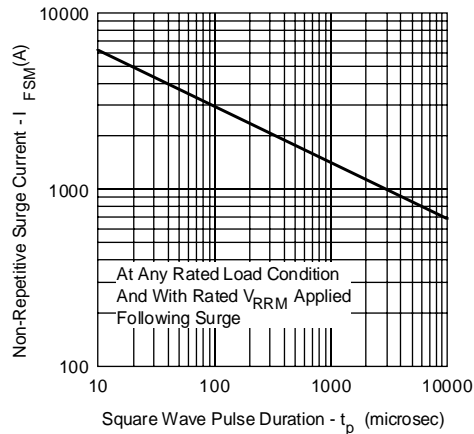


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

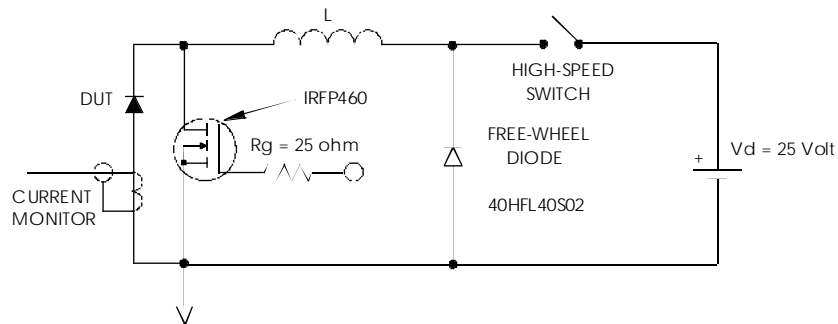


Fig. 8 - Unclamped Inductive Test Circuit